Delivering Quality Services
Essential Tools Workshop

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FIDIC Business Plan

Strategic Objective 3	**BE THE AUTHORITY ON ISSUES RELATING TO BUSINESS PRACTICE**	**As the role of consultants keeps evolving and globalization increases its demand for world-class quality services tailored to local conditions, the need to develop, propagate and promote acceptance of global best business practices for the industry becomes essential.**
		<u>Main Focus</u> **- Develop and publish new documents** **- Major attack on Unlimited Liability** **- Produce new practical tools**

Delivering Quality Services – Essential Tools

Business practices

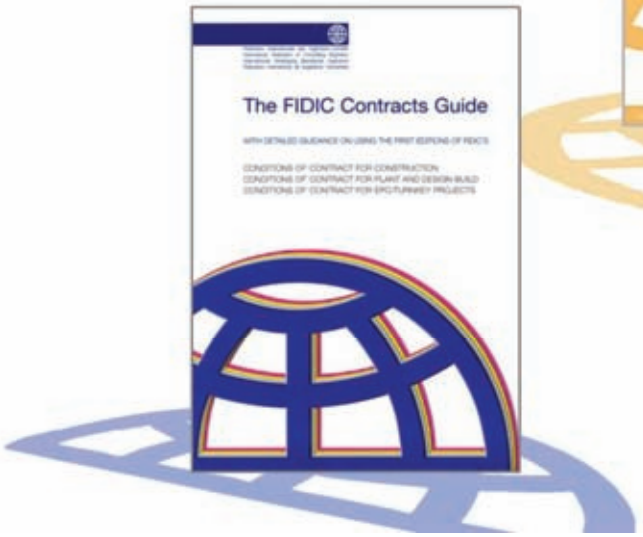
To be the authority on business practice

Services	Consultant Selection	Guidelines
	Informed Purchaser	Policy
	Quality of Construction	Guide
	Conflict of Interest	Policy
	Scope of Services definitions	Guide *(draft)*
	Reviewing the work of others	Policy *(draft)*
Project Delivery	HIV-AIDS	Policy, Clauses
	Consultant in design-build	Guide *(draft)*
	Consultant in PFI	Guide *(draft)*
	Provision of OMS services	Guide
	Project cost estimates	Guide
	Tendering procedures	Guide
Quality Management	System	Guides, Training kit
Risk Management	Dealing with risk	Manual
	Project insurance	Guide
	Professional Liability Insurance	Guide
	Insurance of large projects	Guide
Dispute Resolution	Amicable settlement	Guide

Delivering Quality Services – Essential Tools

Works contracts

FIDIC publishes internationally recognized forms of contract for infrastructure works



Delivering Quality Services – Essential Tools

Business practices

Policy statements and resources

- The role of the consulting engineer during the execution of a project
- Selection, engagement and remuneration of consulting engineers
- Projects in which consultants have a financial interest other than a normal fee
- Transfer of technology
- Consulting engineers and the environment
- Guarantees, bonds and retentions
- HIV-AIDS in the construction sector
- Consulting engineers and the environment
- The consulting engineer in turnkey projects
- Professional risk and responsibility
- Alternative dispute resolution
- Quality management
- Quality of Construction
- Collateral warranties
- Contingent legal fees
- The expert witness
- Limitation of liability
- Transfer of technology
- Conflict of Interest
- Informed purchaser
- Business Integrity
- Site safety
- Copyright

Delivering Quality Services – Essential Tools

Business practice

Quality Based Selection

Quality Management

Business Integrity

About quality management
About integrity management

Environment management

Environment guide

Sustainablity guide

Management systems
Sustainability initiatives

Capacity building

Consultant selection

Risk management

Training
Abcut consultant selection

Guides Under Development

Definition of Services Guide – [DOS]

The Consultants Brief Guide

[Possible appendix to DOS]

Construction Monitoring Scope Guide

[Possible appendix to DOS]

Definition of Services [DOS] Guide

1. **Appointment Phase** [Engagement]
2. **Pre-Design Phase** [Programming]
3. **Schematic Design Phase** [Concept / Preliminary]
4. **Developed Design Phase** [Design Development]
5. **Construction Documentation Phase** [Detailed Design / Working Drawings / Contract Documents]
6. **Building Permission Application Phase**
7. **Procurement Phase** [Contract Award / Bidding / Negotiation]
8. **Construction Phase** [Project supervision/Construction Monitoring]
9. **Post-Construction Phase** [Commissioning / Defects Liability]

1 - Appointment Phase [Engagement]

- Determine Scope of Works
- Agree Scope of Services [brief] and exclusions
- Agree services to be provided directly by client
- Discuss with client expectations of quality
- Define the sustainability focus
- List sub-consultants
- Agree Conditions of Engagement
- Agree and define Integrity Management Protocols
- Agree fee basis and method of fee variation
- Agree Limit of Liability any exclusions
- List information to be supplied by Client

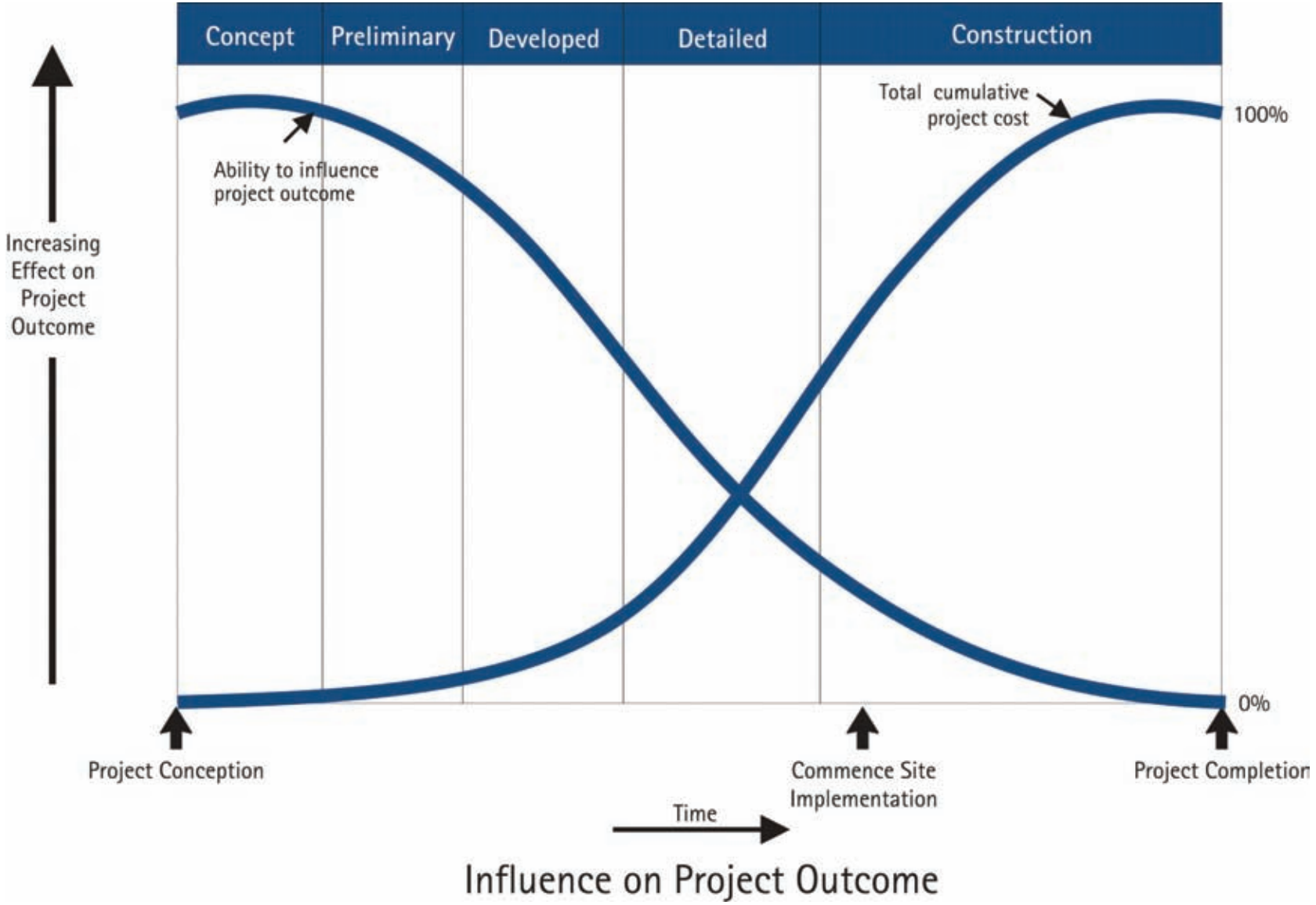
2 - Pre-Design Phase [Programming]

- Site evaluation/procurement
- Topographical survey
- Survey of existing structures
- Preliminary/desktop geotechnical study
- Environmental status assessment
- Heritage/archaeological assessment
- Planning restraints evaluation
- Regulatory framework evaluation
- List consents and permits that will be required
- Agree with client appropriate form of project delivery
- Preliminary estimates (+/- 30% or higher for complex work)
- Outputs: Reports, Bulk and location sketches, ballpark estimate

3 - Schematic Design Phase [Concept / Preliminary]

- Environmental Impact Assessment
- Site specific investigation of geotechnical, contamination, wind, acoustic, etc
- Preliminary analysis/design in all disciplines
- Evaluation of alternatives
- Preliminary sizing of primary/key elements
- Description/outline of secondary elements
- Preliminary review of utility Capacity – electricity, gas, telecoms, water, wastewater
- Indicative specification (schedule of finishes)

Delivering Quality Services – Essential Tools



3 - Schematic Design Phase - cont

- Cross discipline coordination
- Pre consent-application meetings with the regulatory authorities
- Review against brief
- Value engineering review
- Preliminary risk assessment
- Estimates on a “square metre rate” basis
- Outputs: Design features report, preliminary drawings, estimates, risk identification report, planning/environmental consent applications

4 - Developed Design Phase [Design Development]

- Analysis/design in all disciplines of primary/key elements
- Detailed review of utility supply capacity
- Plans and elevations of primary/key elements
- Drawings of typical and key details
- Analysis of generic secondary elements
- Drawings showing scope/extent of secondary elements
- Define elements to be covered by proprietary design
- Cross discipline coordination
- Value engineering review & detailed risk assessment
- Preliminary peer review Highlight and address H&S issues.
- Estimates on an elemental basis
- Outputs: Updated design features report, “60%” documentation

5 - Construction Documentation Phase [Detailed Design / Working Drawings / Contract Documents]

- Final analysis/design in all disciplines, of all elements
- Plans, elevations and details of all elements
- Full "trade" specifications
- "Performance based specifications" for elements to be covered by proprietary design [design by contractor]
- Full cross discipline coordination
- Final peer review
- Update risk assessment
- Highlight significant and unusual H&S issues
- Pre-tender estimates
- Estimate of construction programme
- Outputs: "For Construction" drawings and specifications

6 - Building Permission Application Phase

- Preparation of Building Permit forms and payment of fees
- Submission of drawings, specifications, calculations and Design Certificates (Producer Statements)
- Review of the design by a Peer Reviewer
- Response to queries raised by the regulatory authority or by a Peer Reviewer
- Modification to the design or documentation at the request of the regulatory authority to incorporate consent conditions
- Outputs: Building approval

7 - Procurement Phase [Contract Award / Bidding / Negotiation]

- Preparation of contract documents
- Specification of insurance conditions, programme, QA requirements, H&S plan requirements
- Specify integrity management protocols
- Pre-qualifying tenderers
- Calling tenders
- Evaluating tenders, including design alternatives
- Negotiation with preferred bidder(s)
- Recommendation of tender acceptance to client
- Signing of contract documents
- Outputs: Construction contract with successful bidder

8 - Construction Phase [Project supervision / Construction Monitoring]

- **Construction monitoring/review of quality and consistency with design**
- **Review of shop drawings and proprietary design elements**
- **Issuing of instructions, variations, change orders**
- **Valuation/negotiation of variations**
- **Payment certificates**
- **Preparation of defects lists**
- **Issue of completion certificate**

9 - Post-Construction Phase [Commissioning / Defects Liability / Project control]

- **Settlement of final account**
- **Commissioning of plant and equipment**
- **Installation of client's FF&E**
- **Collection of as-built drawings and operation manuals**
- **Collection of all verification documentation,**
- **Obtaining compliance certification from regulatory authority**
- **Ongoing "maintenance period" inspections**
- **Final inspection and sign-off**

DDG – Detailed Checklists

Design Documentation Guidelines | Structural

Concept Design Phase

Design Process	Deliverables	Commentary
Inputs: • Client briefing, including budget and time schedule. ☐ • Geotechnical information on types of foundation systems. ☐ • Survey information, including legal and physical. ☐ • Architectural sketch concept drawings (e.g., bulk and location). ☐ • Site constraints, including planning and fire issues. ☐ • Conditions of consents. ☐ • Existing building and site information/records. ☐ **Design:** • Structural type and form. ☐ • Main gravity and lateral load resisting systems. ☐ • Floor system. ☐ • Ground retention systems. ☐ • Foundation system. ☐ • Façade support systems. ☐ • Roof support systems. ☐ • Identify structural scheme options. ☐ • Special project features concepts, (e.g., large canopies). ☐ • Design co-ordination of key elements with other disciplines. ☐ • Identify responsibility for control and set-out of dimensions. ☐ • Identify responsibility for design co-ordination and management. ☐	**Drawings:** • Sketch drawings. ☐ **Reports:** • Sketch drawings where necessary within report. ☐ • Structural concept design brief, including floor loadings. ☐ • Key risks and assumptions. ☐ • Concept report outlines key issues and options considered. ☐	1. Costing only on square metre rate basis. 2. Concept and preliminary design phases are often combined on smaller projects. 3. Agree roles and responsibilities for all participants in project procurement process. 4. Discuss with client the requirements and programme for client information and approvals. 5. Establish project procedures for communication, document issue, approvals, etc. Note: larger projects may have a project procedure manual or web-based document control systems. 6. Establish a design programme for key milestones and deliverables including design team co-ordination.

DDG – Detailed Checklists

Design Documentation Guidelines | Structural

Detailed Design Phase

Design Process	Deliverables	Commentary
Inputs: • Client approval of completed developed design, including ratification of the cost estimate. ❐ **Design:** • Complete the design and coordination of all structural elements, including connection details, except for elements that can be adequately covered by non-specific design codes. ❐ • Address serviceability and maintenance criteria in the design. ❐ • Highlight significant/unusual health and safety risks arising from the structure that were identified through the design process (if any). ❐ • Co-ordinate relevant information with other disciplines. ❐	**Drawings:** • Drawings defining all structural elements, including plans, elevations, sections and details, with adequate cross-referencing. ❐ • Define all connections by either defining specific connection details or referencing to industry standard connection details (e.g., HERA connection details) or specifying forces for a propriety connection system. ❐ • Construction sequences and positions of control/construction joints. ❐ • Includes stairs, plant platforms and façade system support. ❐ • Reinforcing details defined (see commentary). ❐ • Precamber/set established for members. ❐ • Include seismic and gravity support of ceiling/partition systems (optional). ❐ **Specifications:** • Detailed specifications for each structural trade. ❐ • Performance specifications where appropriate, including performance criteria for proprietary design. ❐ • Method statements for critical construction processes governing design. ❐ • Design loadings for design of proprietary non-structural elements e.g., glazing, seismic bracing of services. ❐ • Define deliverables from contractor e.g., producer statements, shop drawings, and testing requirements. ❐	1. Detailed design generally provides a level of documentation to clearly define the design of all structural elements. Design details should be coordinated with other disciplines. However, the documents produced in this phase may not directly be able to be 'built' from. 2. Structural drawings should dimension the main building grids, critical structural elements, and other elements that are the direct responsibility of the structural engineer. 3. Reference the architectural plans or other disciplines for other dimensions (unless agreed otherwise). 4. HERA report DR4-106, *Structural Steelwork* documentation 'Specification', sections vi, vii, and ix outline documentation details that need to be addressed in the working drawings and specifications. 5. Design and documentation of secondary architectural elements are generally shown on the architect's drawings; the structural engineer will have input where requested by the architect. 6. Reinforcing details defined means that all reinforcing required to construct the project is defined on the drawings, in quantum and size, such that shop drawings and/or bar bending schedule can be produced by others without further additional information.

DDG – Detailed Checklists

Design Documentation Guidelines | Structural

Construction Design Phase

Design Process	Deliverables	Commentary

Inputs:
• Construction programme and methodology, including craneage or access restrictions. ❒
• Client approved ('for construction') drawings and specifications. ❒
• Design and performance requirements for propriety elements. ❒
Design:
• Design of proprietary systems, e.g., flooring, glazing, plant support, etc. ❒
• Detailed co-ordination required with other disciplines, site conditions, proprietary elements, erection requirements, and shop details. ❒
• Prepare structural construction sequence, temporary erection and heath and safety plans. ❒
• Determine the impact of temporary erection loads and construction sequence on structural members and connections. ❒
• Check the design of structural members and connections for temporary construction conditions and loads, and redesign if required. ❒
• Liaise with the design and construction teams to coordinate any revisions to the detailed design. ❒
	Drawings:
	• Drawings (incl. shop drawings and rebar schedules) on an elemental basis, including position, dimension, materials and finish of all details, including relevant material specifications (steel, timber, precast, etc.). ❒
	• Site management plans and/or method statements defining the construction sequencing and temporary erection requirements. ❒
	• Details of the temporary works.
	• Revision of drawings, details and specifications arising from contract agreement, building consent, and construction requirements. ❒
	Concrete:
	• For non-standard conditions the following are to be provided where applicable. ❒
	  • formwork ❒
	  • propping and bracing ❒
	  • scaffolding and access ❒
	  • proprietary system layout drawings and connection details ❒
	  • embedded items and penetrations defined and located. ❒
	Steel:
	• Shop drawings generally as defined in *Australian Detailer Handbook ASDH101* or the *American Institute of Steel Retailers Guidelines*. ❒
	Review:
	• Review shop drawings, technical specification, and construction method statement submissions for consistency with detailed design. ❒
		1. Before the commencement of construction drawings the following need to be in place; contract details confirmed and tender accepted; sub-contract agreements confirmed; and owner supplied components available.
		2. Deliverables contain sufficient details for elements to be manufactured/constructed without reference to other documents, i.e. ,'the details have co-ordinated the relevant design information across all disciplines and can be built from'.
		3. Final determination of some dimensions may be dependent on proprietary design of non-structural elements (e.g., mechanical services duct sizes). Such proprietary design may need to be advanced to enable structural dimensions to be completed.
		4. The constructor is responsible for managing health and safety risks during the construction phase.

The Consultants Brief – A Guide

[Possible appendix to DOS]

The Brief *[or Consultant's Commissioning Guide – Terms of Reference]* - Defines the relationship between client and consultant in terms of:

- Scope of work
- Deliverables (Documents)
- Programme (Schedule)
- Contractural terms and Liabilities

The Consultants Brief – A Guide

Key Points

- All consultant commissions, even those that do not involve a formal selection process, require a well-defined brief
- A brief can be used for the calling of competitive proposals. However, selection on price alone does not always result in the lowest overall cost for a project.
- A well-prepared brief will enable the consultant to submit relevant information on a range of attributes (skills, relevant experience, personnel etc) that will then allow the client to make a selection based on quality.

The Consultants Brief – A Guide

A guide would:

- Assist clients to fully define their requirements
- Enable clients to better evaluate competing consultants
- Assist consultants to fully evaluate project requirements and make adequate allowance for the level of service required.
- Enable consultants to differentiate their services relative to their competitors

The Consultants Brief – A Guide

The Brief

- May be prepared by the client prior to calling for proposals (bids)
- May be defined by the consultant as part of his proposal
- May be prepared by a third party consultant
- May be prepared jointly by the client and his Trusted Advisor

Key Requirements of a Brief

- 1) Client Details
  - Client contact details
  - Nature of client's business
  - Vision/objectives that the client has for the project;
  - Tenant/end user details (if different from client);
  - Requirements for stakeholder consultation;
  - Confidentiality requirements.
- 2) Project Detail
  - Description of project;
  - Details of location, size, estimated cost or budget;
  - Required outcomes;
  - Levels of quality required;
  - Clearly defined scope of services for each consultant.

Key Requirements of a Brief

- 3) Project Team Makeup
  - List of team members (e.g. client, project manager, other consultants, contractors);
  - Organisation chart;
  - Responsibility matrix;
  - Likely method of contractor procurement.

- 4) Technical Brief
  - The relevant standards to be used;
  - Particular requirements for loading, services, future flexibility etc.;
  - Particular requirement for durability, plant processes;
  - Requirements for internal/external peer reviews;
  - Particular or unusual site conditions;
  - ESD [PSM] requirements;
  - Relevant statutory requirements (if not obvious);
  - Requirement to reuse existing plant/ equipment/materials.

Key Requirements of a Brief

- 5) Project Staging & Programme
  - Breakdown of "design" stages
    - pre-design studies
    - schematic design
    - developed design
    - tender documentation etc
  - Timetable for delivery of documentation;
  - Expected timing/programme of physical works;
  - Requirements for early occupation, partial completion etc.;
  - Impact on existing operations/ occupants;
  - Programme for consents and approvals.

Key Requirements of a Brief

- 6) Attendance & Reporting by Consultant
  - Requirements for attendance at and reporting to meetings (project control, design co-ordination, construction/site etc.);
  - Requirements for attendance at workshops (design review, risk assessment, project procedures, value management etc).
- 7) Deliverables
  - Comprehensive lists of deliverables (e.g. reports, drawings, specification etc.);
  - List to include frequency/number of issues and number of sets per issue;
  - Guidelines for quality of documentation
- 8) Construction Monitoring (Supervision)
  - Level /intensity of monitoring required

Key Requirements of a Brief

- 9) Cost Control (Budget)
  - Method by which cost control will be measured and managed;
  - Value Management processes
  - Relative priority of capital expenditure versus operating costs;
  - Cost reporting procedures.

- 10) Information to be Supplied by Client
  - Pre-project studies;
  - Survey/title information;
  - Geotechnical information;
  - Existing drawings.

Key Requirements of a Brief

- 11) Client Approval Process
  - Process by which client will progressively approve design during the documentation stages.
- 12) Scope/Design Variation
  - Process by which variations in consultant's scope of work will be handled in terms of fee and programme.
- 13) Risk Management
  - How risks will be identified;
  - How risk will be managed and mitigated.

Key Requirements of a Brief

- 14) Quality Assurance
  - Level of quality assurance required;
  - Is a project-specific quality plan required?
- 15) Contractual Issues
  - Conditions of engagement to be used
  - Level of Professional Liability to be carried by consultant;
  - Level of Public Liability cover to be held by consultant.
- 16) Health & Safety Issues
  - Detail of site access and Health & Safety issues during the design stages of the project;
  - Required role/involvement of the consultant in Health & Safety during the construction stages.

Key Requirements of a Brief

- 17) Integrity Management
  - Required protocols for integrity management
- 18) Selection Criteria
  - QBS
  - Direct Negotiation
  - Brookes Law
  - *Price based*
- 19) Levels of Service
  - Full/partial
  - Quality/quantity of documentation

Construction Monitoring – Scope Guide

[Possible appendix to DOS]

- "Full" Consulting Engineering service includes construction monitoring
- FIDIC Recommends:
  - *"The Consulting Engineer should recommend to his Client the advantages of a full professional service providing continuity from inception to completion of a project."*
- Great variation in construction monitoring/supervision practices
- Best Practice >> Design Consultant (or alternate) should monitor contractor's QA and sample work

Construction Monitoring – Scope Guide

- ACENZ has developed a 5 level system based on:
  - Project size
  - Project importance
  - Project complexity
  - Experience, skill and QA management of contractor

Construction Monitoring – Scope Guide

LEVEL	REVIEW	COMMENT
CM1	Monitor the outputs from another party's quality assurance programme against the requirements of the plans and specifications. Visit the works at a frequency agreed with the client to review important materials of construction critical work procedures and/or completed plant or components. Be available to advise the constructor on the technical interpretation of the plans and specifications.	This level is only a secondary service. It may be appropriate: • for the design consultant when another party is engaged to provide a higher level of construction monitoring or review during the period of construction or • when the project works are the subject of a performance based specification and performance testing is undertaken and monitored by others.
CM2	Review, preferably at the earliest opportunity, a sample of *each* important work procedure, material of construction and component for compliance with the requirements of the plans and specifications and review a representative sample of *each* important completed work prior to enclosure or completion as appropriate. Be available to provide the constructor with technical interpretation of the plans and specifications.	This level of service is appropriate for smaller projects of a routine nature being undertaken by an experienced and competent constructor and where a higher than normal risk of non compliance is acceptable. It provides for the review of a representative sample of work procedures and materials of construction. The assurance of compliance of the finished work is dependent upon the constructor completing the work to at least the same standard as the representative sample reviewed.

Construction Monitoring – Scope Guide

CM3	Review, to an extent agreed with the client, *random samples* of important work procedures, for compliance with the requirements of the plans and specifications and review *important* completed work prior to enclosure or on completion as appropriate. Be available to provide the constructor with technical interpretation of the plans and specifications.	This level of service is appropriate for medium sized projects of a routine nature being undertaken by an experienced constructor when a normal risk of non compliance is acceptable.
CM4	Review, at a frequency agreed with the client, *regular samples* of work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review the *majority* of completed work prior to the enclosure or on completion as appropriate.	This level of services is appropriate for projects where a lower than normal risk of non compliance is required.

Construction Monitoring – Scope Guide

CM5	Maintain personnel on site to *constantly* review work procedures, materials of construction and components for compliance with the requirements of the plans and specifications and review completed work prior to enclosure or on completion as appropriate.	This level of service is appropriate for: • major projects • projects where the consequences of failure are critical • projects involving innovative or complex construction procedures. The level of service provides the client with the greatest assurance that the completed work complies with the requirements of the plans and specifications.

Construction Monitoring – Scope Guide

CRITERIA	K	ASSESSMENT				VALUE
Project Status	K_A	Small **1**	Medium **2**	Large **3**	Major **4**	
Complexity of work procedures	K_B	Routine **2**	Difficult **4**	Complex **6**		
Relevant experience of constructor	K_C	Inexperienced **6**	Experienced **2**	Certified ISO 9000 **1**		
Consequences of non-compliance	K_D	Minor **1**	Moderate **4**	Serious **6**	Critical **12**	
KTOTAL = $K_A + K_B + K_C + K_D$						

Construction Monitoring – Scope Guide

CRITERIA	K	ASSESSMENT				VALUE
Project Status	K_A	Small **1**	Medium **2**	Large **3**	Major **4**	
Complexity of work procedures	K_B	Routine **2**	Difficult **4**	Complex **6**		
Relevant experience of constructor	K_C	Inexperienced **6**	Experienced **2**	Certified ISO 9000 **1**		
Consequences of non-compliance	K_D	Minor **1**	Moderate **4**	Serious **6**	Critical **12**	
KTOTAL = $K_A + K_B + K_C + K_D$						

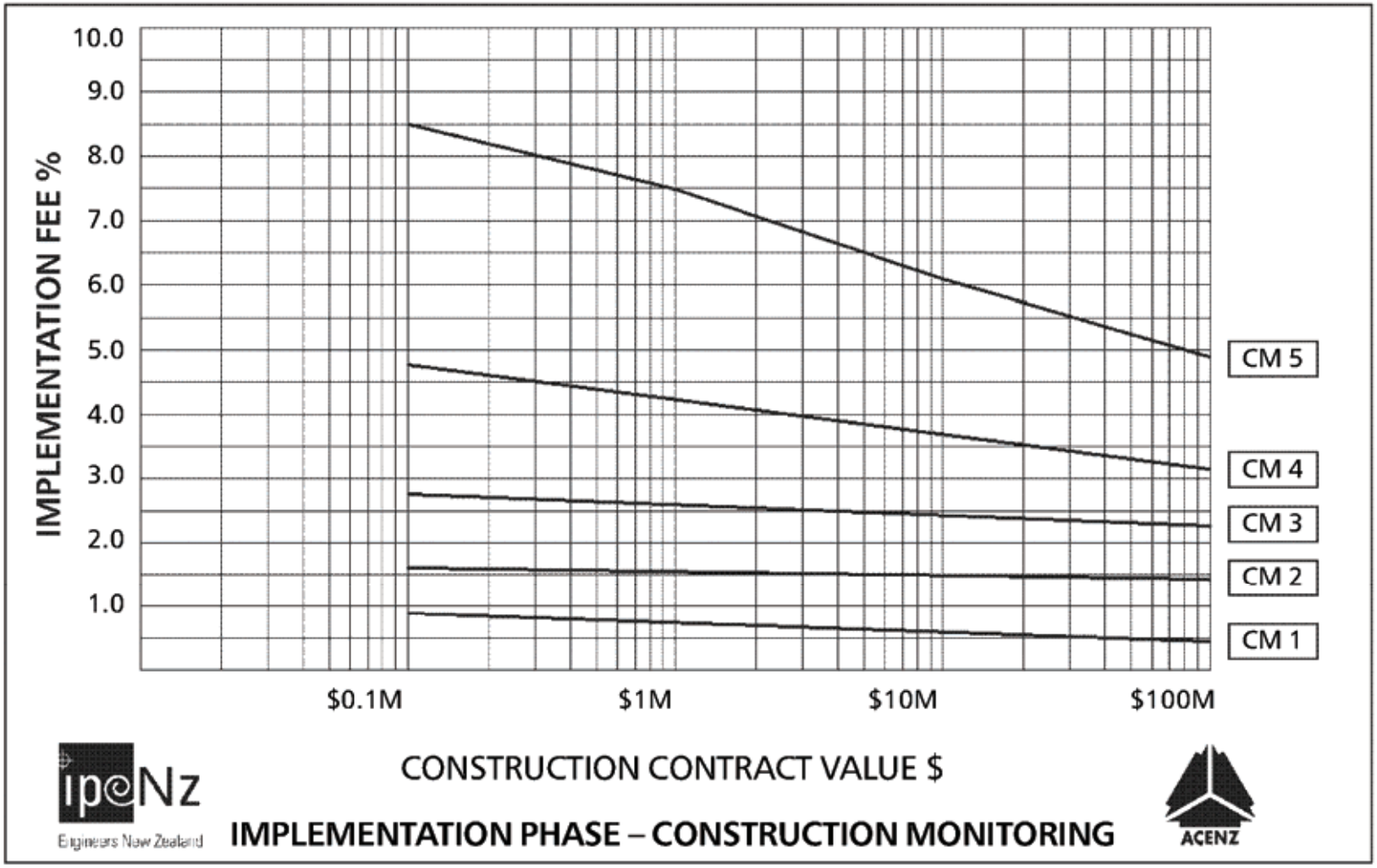
Construction Monitoring – Scope Guide

K TOTAL	CM1	CM2	CM3	CM4	
5-6		**Sampling only**	-	-	-
7-8		N/A	**Weekly**	-	-
9-10		N/A	**Twice Weekly**	-	-
11-12	Secondary Service	N/A	N/A	**Twice Weekly**	-
13-14		N/A	N/A	**Every second day**	-
15-16		N/A	N/A	**Daily**	-
17 +		N/A	N/A	N/A	**Constant**

N/A = Not Appropriate

Secondary service = This level of service is only appropriate when another party is responsible for undertaking the primary review of construction standards.

Construction Monitoring – Scope Guide



QUESTIONS – Definition Of Services

- Do you think the DOS Guide would be useful in your country?
- Do you think the DOS Guide would be useful in developing countries?
- Do you agree with the number and naming of the nine phases?
- Should the guide include the detailed checklists for each phase?
- Should the versions be developed for other work sectors (Infrastructure, Industrial) ?

QUESTIONS – Briefing Appendix

- Would a Briefing Guide be of use in your country?
- Do you think FIDIC should include a briefing guide within the DOS guide?
- Are the key requirements appropriate?
- Are there other issues to be addressed in a brief?
- Which work sectors would this work in?

QUESTIONS – Construction Monitoring

- Would a construction monitoring scope guide be of use in your country?
- Do you think FIDIC should include a similar guide within the DOS guide?
- Are the monitoring levels appropriate?
- Is the matrix assessment table appropriate?
- Which work sectors would this work in?
- What are the arguments *for* full service, including construction monitoring

QUESTIONS – GENERAL

What other guides or policies should FIDIC prepare?

What guides or Practice Notes does your MA have (in operation or under preparation) that may be applicable to an international audience?

Delivering Quality Services
Essential Tools Workshop

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